

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 38, 39, 48, 49, 51-53, 58, 61, 67, 82, and 84 have been amended. No new matter has been added. Claim 47 has been canceled without prejudice or disclaimer. After amending the claims as set forth above, claims 38-46 and 48-85 are now pending in this application.

Rejection under 35 U.S.C. § 102

Claims 61-65, 72, 75, 76, and 78-81 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Pub. No. 2003/0013015 to Klein *et al.* (hereafter “Klein”). This rejection is respectfully traversed.

At the outset, Applicants would like to note that the effective filing date of the present application is October 21, 2003, which is the date of filing the parent Norwegian patent application (the present application claims priority to International Application No. PCT/NO04/00321, which in turn claims priority to Norwegian Application No. 2003 4702). Accordingly, Klein *et al.* does not qualify as prior art under 35 U.S.C. § 102(b). Applicants assume, however, that the Examiner intended to refer to 35 U.S.C. § 102(e), and will proceed under that assumption for the remainder of this response.

Applicant also notes that on page 3 of the Office Action, the Examiner indicated that Klein does not disclose all of the features of Claim 63, and suggested that it would have been obvious to modify Klein in view of Dansui to provide the features of Claim 63. Accordingly, Applicant assumes that the Examiner did not intend to reject Claim 63 under 35 U.S.C. § 102, but rather under 35 U.S.C. § 103.

Klein discloses an electrochemical battery which includes a cell 1 having a negative electrode 2, a separator 4, and an electrically conductive lamination 5 which includes an inner metal layer 7 and a polymeric outer layer 8. See Klein at paragraphs 0042 and 0048. Klein

discloses that the negative electrode 2 can be made of, among other materials, a metal hydride and that the inner metal layer 7 can be made of, among other materials, aluminum. See Klein at paragraphs 0043 and 0048. The Examiner argued on page 2 of the Office Action that the negative electrode 2 of Klein serves as a first sheet including a hydrogen storage material and that the inner metal layer 7 serves as a second sheet including a high energy density metal.

As admitted by the Examiner on page 17 of the Office Action, however, Klein does not disclose a hydrogen electrocatalyst in combination with a hydrogen storage material and a high energy density metal, as recited in claim 61. Accordingly, at least one element recited in amended Claim 61 is not disclosed in Klein, and therefore Claim 61 and its associated dependent claims are not anticipated by Klein.

Reconsideration and withdrawal of the rejection of Claims 61-65, 72, 75, 76, and 78-81 under 35 U.S.C. § 102 is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 38-44, 55, 60, 82, 83, and 85 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein in view of U.S. Patent No. 6,033,805 to Dansui *et al.* (hereafter “Dansui”).

Amended Claim 38 recites an electrode for use in an electrochemical cell comprising a first sheet comprising a hydrogen storage material, a second sheet separate from the first sheet, the second sheet comprising a high energy density metal that is configured to act as a hydrogen source for the hydrogen storage material on reaction with electrolyte in the cell, wherein the high energy density metal is mixed with at least one of polytetrafluoroethylene or graphite, and a hydrogen electrocatalyst. Claims 39-44, 55, and 60 depend from Claim 38.

Amended Claim 82 recites a method of producing an electrode for an electrochemical cell, the electrode comprising a hydrogen storage alloy and a high energy density metal, the method comprising sintering or forming with a binder a high energy density metal into a first

sheet, forming a second sheet comprising a hydrogen storage alloy, and pressing the first and second sheets together to form the electrode, wherein the electrode further includes a hydrogen electrocatalyst. Claims 83 and 85 depend from Claim 82.

As discussed above, Klein does not disclose or suggest a hydrogen electrocatalyst in combination with a hydrogen storage material and a high energy density metal, as recited in Claims 38 and 82. Dansui fails to remedy the deficiencies of Klein because Dansui also does not disclose or suggest these features. As a result, the combination of Klein and Dansui does not disclose or suggest the combinations of features recited in Claims 38 and 82. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 45 and 46 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein and Dansui in view of U.S. Patent No. 5,965,295 to Bando *et al.* (hereafter “Bando”). Claim 66 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein in view of Bando. These rejections are respectfully traversed.

Bando fails to remedy the deficiencies of Klein and Dansui discussed above in regard to independent Claims 38 and 61, from which Claims 45, 46, and 66 depend. Reconsideration and withdrawal of these rejections is respectfully requested.

Claims 47-54 and 84 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein and Dansui in view of U.S. Patent No. 6,461,766 to Young *et al.* (hereafter “Young”). Claims 67-71 and 77 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein in view of Young. These rejections are respectfully traversed.

As noted above, Klein and Dansui do not disclose or suggest a hydrogen electrocatalyst in combination with a hydrogen storage material and a high energy density metal, as recited in Claims 38, 61, and 82, from which Claims 48-54, 67-71, 77, and 84 depend.

Young discloses a hydrogen storage powder and notes that hydrogen storage powders have been used in battery electrode materials and other applications. See Young at col. 1, lines

17-28. Young discloses that powder is processed by oxidizing dehydrided powder to provide an engineered surface layer having increased initial activation and reduced pretreatment requirements. See Young at col. 8, lines 58-65. Young further discloses that a passivating material can be added to the powder after dehydriding the powder but prior to oxidation to improve initial activation of the powder, with the passivating material being an alloy, metallic fine powder, or inorganic compound, and can include Cr, Fe, Co, Ni, Cu, Zn, Mo, Ta, and W.

The Examiner argued on pages 11-12 and 17-18 of the Office Action that it would have been obvious to modify Klein and Dansui or Klein by the teachings of Young to provide an electrocatalyst in combination with a hydrogen storage material and a high energy density metal, as recited in Claims 38, 61, and 82. Applicant respectfully disagrees.

Young does not disclose, teach, or suggest that the passivating material is a hydrogen electrocatalyst. As discussed on page 8, lines 27-29, and page 9, lines 8-12, of Applicant's specification, a hydrogen electrocatalyst increases the reaction rate of the hydrogen reaction that produces hydrogen. One of ordinary skill in the art would have understood that Young instead discloses that "[t]he passivating material preferably adheres to or covers part of the surface of the hydrogen storage particles prior to oxidation to reduce surface oxidation and improve initial activation" of the hydrogen storage particles. See Young at col. 10, lines 9-14. Young does not disclose or suggest that the passivating material increases the reaction rate of the hydrogen reaction or otherwise acts as a hydrogen electrocatalyst. In other words, Young itself provides no guidance for using a hydrogen electrocatalyst in an electrode or electrochemical cell, as recited in Claims 38, 61, and 82.

Instead, it appears that the Examiner has used the disclosure of Applicant's own application as guidance for using the passivating material of Young by reasoning that Young discloses materials for the passivating material that correspond to examples of hydrogen electrocatalysts disclosed in Applicant's application. However, Applicant's disclosure would not have been available to one of ordinary skill in the art at the time Applicant's invention was made. Therefore, it is not permissible for the Office to conclude that it would have been obvious to

combine Young with Klein and Dansui or Klein merely because Young discloses passivating materials which correspond to the exemplary materials disclosed for a hydrogen electrocatalyst in the disclosure of Applicant's application. Without the guidance of Applicant's application, one of ordinary skill in the art would not have looked to the teachings of Young when considering whether to include a hydrogen electrocatalyst in an electrode or electrochemical cell to increase the reaction rate of the hydrogen reaction.

Nor does Young disclose or suggest that a hydrogen electrocatalyst is used in combination with a hydrogen storage material and a high energy density metal, as recited in Claims 38, 61, and 82. Instead, Young discloses a hydrogen storage powder which includes a passivating material. Young does not disclose or suggest that a hydrogen storage material is combined with a high energy density metal as well as a hydrogen electrocatalyst. Klein and Dansui also fail to disclose or suggest the combination of (1) a hydrogen electrocatalyst, (2) a hydrogen storage material, and (3) a high energy density metal, as recited in claims 38, 61, and 82. As a result, these references do not provide any disclosure or suggestion to one of ordinary skill in the art to combine these references to provide the features of Claims 38, 61, and 82.

As discussed on page 4, line 1, to page 6, line 6, of Applicant's specification, a corrosion problem has existed for electrodes and metals in cells, such as metal-air fuel cells. For example, as noted on page 5, lines 6-14, the dissolution rate of metal via corrosion is proportional to the rate of hydrogen evolution, with the dissolution rate of metal being also proportional to the loss in capacity for metal-air fuel cell.

Applicant advantageously addresses this corrosion problem by providing a high energy density metal to act as a source of hydrogen, a hydrogen electrocatalyst to provide a hydrogen reaction region for producing electrical energy, and a hydrogen storage material to store the hydrogen when the cell is otherwise not in use, as discussed on page 8, line 21, to page 9, line 20, of Applicant's specification. As discussed on page 8, lines 21-24, of Applicant's specification, this configuration advantageously maintains most of the energy of a cell as hydrogen so that only part of the energy is lost as thermal energy in the corrosion reaction.

Applicant submits that this accomplishment of an unpredictable and improved result demonstrates the non-obviousness of Applicant's invention and that it would not have been obvious to combine a hydrogen electrocatalyst with a hydrogen storage material and a high energy density metal, as recited in Claims 38, 61, and 82, particularly in view of the lack of teaching or suggestion of such a combination in the prior art.

For at least these reasons, reconsideration and withdrawal of these rejections is respectfully requested.

Claims 57-59 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein and Dansui in view of U.S. Pub. No. 2003/0054218 to Hampden-Smith *et al.* (hereafter "Hampden-Smith"). Claim 74 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein in view of Hampden-Smith. These rejections are respectfully traversed. Hampden-Smith fails to remedy the deficiencies of Klein and Dansui, and Klein, discussed above in regard to independent claims 38 and 61, from which Claims 57-59 and 74 depend. Reconsideration and withdrawal of these rejections is respectfully requested.

Claim 56 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein and Dansui in view of U.S. Pub. No. 2002/0042000 to Bauerlein (hereafter "Bauerlein"). Claim 73 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Klein in view of Bauerlein. Bauerlein fails to remedy the deficiencies of Klein and Dansui, and Klein, discussed above in regard to independent Claims 38 and 61, from which Claims 56 and 73 depend. Reconsideration and withdrawal of these rejections is respectfully requested.

* * *

It is submitted that each outstanding rejection to the Application has been overcome, and that the Application is in a condition for allowance. The Applicants request consideration and allowance of all pending claims.

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. The Applicants expressly reserve the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present application.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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